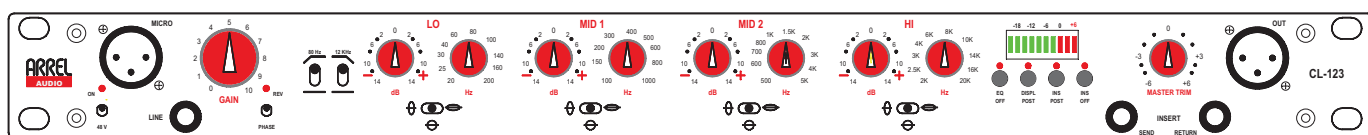




CL-123 Channel Strip



User Manual

Issue 0.1

SAFETY INSTRUCTIONS



Always follow the precautions listed below to avoid any possibility of serious injury or even death from electrical shock, short-circuiting, damages, fire or other hazards. These precautions include, but are not limited to, the following:

- Do not expose the instrument to liquids and rain. Do not use it near water or in damp or wet conditions, or place containers on it containing liquids. If any liquid seeps turn off the power and unplug the power cord from the AC outlet.
- Do not put burning items, such as candles, on the unit. A burning item may fall over and cause a fire.
- This instrument contains no user-serviceable parts. Do not open the instrument or attempt to disassemble or modify the internal circuit.
- Never insert or remove an electric plug with wet hands.
- Check the electric plug periodically and remove any dirt or dust which may have accumulated on it.
- Do not place the power cord near heat sources such as heaters or radiators, and do not excessively bend or otherwise damage the cord, place heavy objects on it, or place it in a position where anyone could walk on, trip over, or roll anything over it.



Always follow the precautions listed below to avoid any possibility of serious injury or even death from electrical shock, short-circuiting, damages, fire or other hazards. These precautions include, but are not limited to, the following:

- Do not connect the instrument to an electrical outlet using a multiple-connector. Doing so can result in lower sound quality, or possibly cause overheating in the outlet itself.
- When removing the electric plug from the instrument or an outlet, hold the plug itself and not the cord. Pulling by the cord can damage it.
- Remove the electric plug from the outlet when the instrument is not to be used for extended periods of time, or during electrical storms.
- Do not place the instrument in an unstable position where it might accidentally fall over.
- Before moving the instrument, remove all connected cables.
- When setting up the product, make sure that the AC outlet you are using is easily accessible. If some trouble or malfunction occurs, immediately turn off the power switch and disconnect the plug from the outlet. Even when the power switch is turned off, electricity is still flowing to the product at the minimum level.
- When you are not using the product for a long time, make sure to unplug the power cord from the wall AC outlet.
- Use only the stand/rack specified for the instrument. When attaching the stand or rack, use the provided screws only. Failure to do so could cause damage to the internal components or result in the instrument falling over.



Information for Users on Collection and Disposal of Old Equipment

This special symbol on the products, packaging, and/or accompanying documents means that used electrical and electronic products should not be mixed with general household waste.

For proper treatment, recovery and recycling of old products, please take them to applicable collection points, in accordance with your national legislation and the Directives 2002/96/EC.

By disposing of these products correctly, you will help to save valuable resources and prevent any potential negative effects on human health and the environment which could otherwise arise from inappropriate waste handling.

For more information about collection and recycling of old products, please contact your local municipality, your waste disposal service or the point of sale where you purchased the items.

[For business users in the European Union]

If you wish to discard electrical and electronic equipment, please contact your dealer or supplier for further information.

[Information on Disposal in other Countries outside the European Union]

This symbol is only valid in the European Union. If you wish to discard these items, please contact your local authorities or dealer and ask for the correct method of disposal.

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ARREL Audio is continuously working to the improvement of its systems and related documentation.
In any case, we reserve the right to change the specifications without notice but in the respect to the current legislation.

Disclaimer:

The information contained in this manual has been carefully checked and we believed is accurate at the time of publication.
In any case, we do not assume any responsibility for inaccuracies, errors or omissions nor any liability for any loss or damage resulting either directly or indirectly from use of the information contained in this manual.

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INTRODUCTION

The **ARREL Audio CL- 123** channel strip has been conceived to give to the professional user a unit that combines high reliability, rugged design, audio quality, versatility and ease of use. **CL-123** is perfect for recording every kind of music from classic, pop/rock, electronic and in all the situations where maximum sound quality and special attention to dynamic range and signal to noise ratio is needed.

The **CL-123** technical specification shows that it is the perfect audio system for actual digital recording 24bit/192kHz environments where superior performance is required.

CL-123 is based on the use of the latest circuit topologies, characterized by very low distortion, ultra-low noise and very wide frequency response.

The **ARREL Audio CL-123** channel strip, is composed by a high quality mic-line preamplifier, a four band parametric equalizer, a level metering system and a flexible insert return. The preamplifier architecture is based on two high dynamic range gain stages to avoid any saturation and the best possible linearity. Even if the input stage of the CL-123 could accept input signals up to +24 dBu, a protection circuit limits the input level at +20 dBu in order to prevent any damage. The CL-123 extended input dynamic range avoids the necessity of the input pad and the gain is controlled by a single large knob. The absence of the input pad means better sonic performances. In fact being it an attenuator it deteriorates the sound quality and reduces the signal to noise ratio.

The channel strip contains a special circuit that allows the connection of microphones even if the unit is turned on with the Phantom Power activated (in any case we do not recommend this practice in order to protect your microphones).

CL-123 also provides a four band fully parametric EQ with High-Cut/Low-Cut filters at fixed cut-off frequencies (80 Hz / 12 kHz) which can be activated by a switch. Each filter stage is completely excluded from the main circuit if not in use. The emphasis/de-emphasis adjustment is based on a special circuit topology that guarantees a very linear and accurate control.

The flexibility of the **CL-123** channel strip is increased by a level meter (mic-line out or equalizer out measurements) and an insert point (send and return electronically balanced) available both on the front panel and on the back panel. The insert point can be configured either as pre eq. or post eq. The insert jacks on the front panel deselect the outboard connected on the back panel. In this way the user can permanently connect the most used outboard to the insert/return connectors on the back panel and, when a new outboard is required, it can be connected by using the front panel connectors disconnecting automatically the back connected outboard. In this way additional outboards can be easily connected with no access on the back panel.

In the CL-123 no compressor is provided. This corresponds to a precise design choice. In fact usually the compressor technology and consequently the compressor sound is a sort of “artistic choice” so ARREL Audio CL-123 give to the user the possibility to connect your preferred compressor as an insert.

Differently from other channel strips, the **CL-123** is dedicated (due to his absolute sonic level quality) to high professional vocal recordings, classical instruments, high dynamic range instruments such as drums and percussions.

ARREL Audio products are designed and manufactured in Italy.

Housing

The **CL-123** has been designed to be compliant with a 1U rack. No specific air conditioning is required for the racks, provided that there is a free flow of air through the rack from front to back and the temperature is maintained in the operating range. Consequently the racks may be stacked.

CL-123 Front Panel Controls and Operations: Input Stage

INPUT SOURCE SELECTION

The CL-123 input stage is based on a differential amplifier so it is “electronically balanced”. If the Line-In 1/4" jack is not inserted on the front panel the mic input is activated, the insertion of the Line In jack disconnects the mic input. Due to its very high dynamic range, the ARREL Audio CL-123 does not require any input PAD switch.

Two XLRs for the mic input are available, the first one on the front panel and the second one on the back panel (Fig. 1 and Fig. 6). Just one mic input at a time can be used.

PHANTOM-POWER SWITCH

Select the proper position of the switch to activate the +48 V Phantom Power (red LED on). To deselect the Phantom Power return to the previous position (red LED off) (Fig. 1).

The switch is subminiature type (short lever) type in order to avoid accidental operations.

PHASE SWITCH

Select the proper position of the switch to activate the phase inversion (red LED on). To deselect the Phantom Power return to the previous position (red LED off) (Fig. 1).

The switch is of the subminiature type (short lever) in order to avoid accidental operations.

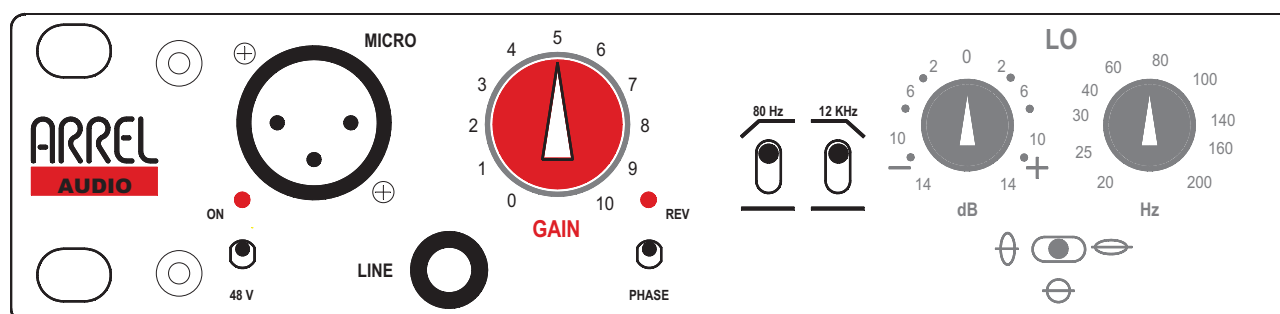


Fig. 1 CL-123 Input section

GAIN CONTROL KNOB

Turn the gain knob in order to select the required amount of gain for either the mic input or the Line input. The maximum gain of the mic input is 66 dB. The gain of the Line input is 30 dB (Fig. 1).

LO-CUT SWITCH

Normal operation (LO-CUT filter not inserted), switch in down position.

LO-CUT filtering activated with the switch in the up position. The filter cut-off frequency is 80 Hz (12 dB / Oct.) (Fig. 1).

HI-CUT SWITCH

Normal operation (HI-CUT filter not inserted), switch in down position.

HI-CUT filtering activated with the switch in the up position. The filter cut-off frequency is 8 KHz (12 dB / Oct.) (Fig. 1).

CL-123 FRONT PANEL CONTROLS AND OPERATIONS: EQ STAGE

The same considerations can be applied to the three bands: LO, MID1, MID2, HI.

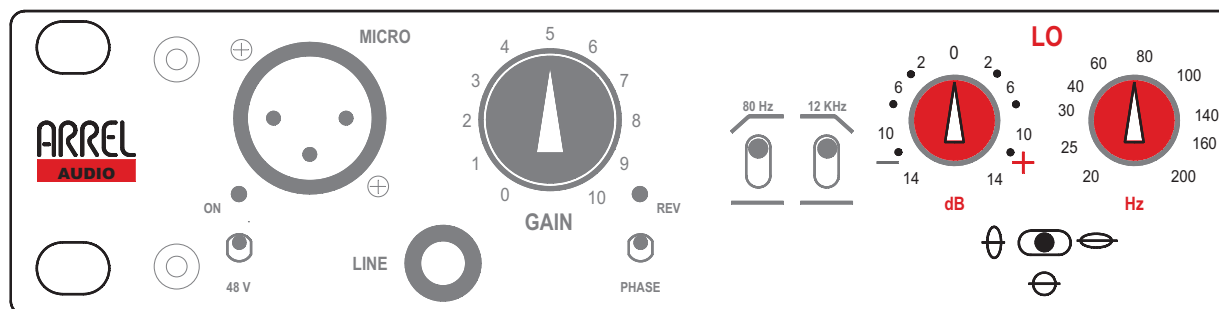


Fig. 2 CL-123 EQ section

FREQUENCY CONTROL KNOB

The frequency band can be easily tuned by rotating the frequency Hz knob.

EMPHASIS/DE-EMPHASIS CONTROL KNOB

Rotate the emphasis/de-emphasis control knob (dB knob) (center detent potentiometer) to change the frequency content in a range of ± 14 dB.

Q CONTROL SWITCH

Turn the toggle switch to change the Q parameter. Three positions are available: narrow, medium, wide.

CL-123 Front Panel Controls and Operations: OUTPUT STAGE and general controls

EQ OFF SWITCH

Push the button to turn off the equalizer (red LED on). Press again to switch to turn on the equalizer (red LED off) (Fig. 3).

DISPL POST SWITCH

Push the button to select DISPLAY POST (red LED on). In this position the level meter is connected at the output of the equalizer. Press again to display the level at the out of the mic-line stage (red LED off) (Fig. 3).

INS POST SWITCH

Push the button to select insert post (red LED on). In this position the insert point is after the equalization stage. Press again to switch to have the insert point before the equalization stage (red LED off) (Fig. 3).

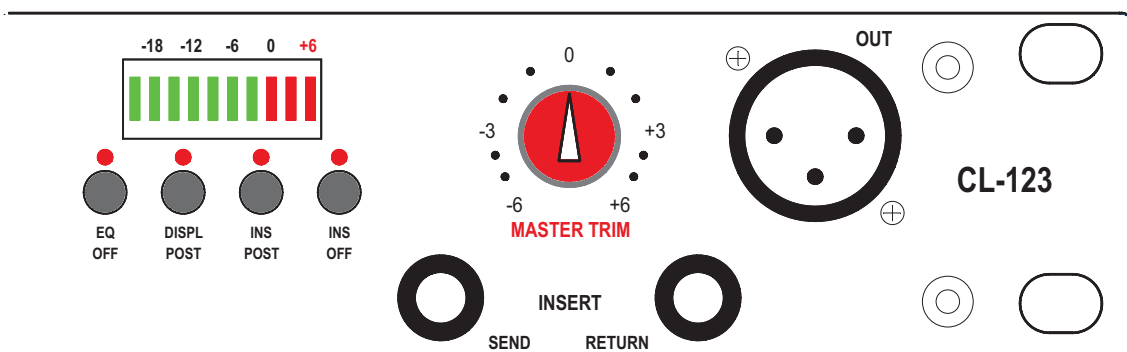


Fig. 3 CL-123 output section

INS OFF SWITCH

Push the button to turn off the insert point (red LED on). Press again to switch turn on the insert point (red LED off) (Fig. 3).

LEVEL INDICATOR

The output level Indicator is based on a 10-LED Bargraph (7 x green LEDs and 3 x red LEDs) with measurement range +6/-21 dBu, The resolution is 1.5 dB per step. The input signal to the level meter can be selected by the DISPL POST SWITCH (Fig. 3).

The level measurement is not affected by MASTER TRIM control.

MASTER TRIM KNOB

Rotate the master trim knob to change the output level in the range of ± 6 dB (center detent potentiometer). The Master Trim gain does not affect the level indicator (Fig. 3).

SEND/RETURN INPUT JACKS

The insert and return connectors are available on the front panel (1/4 "jack) (Fig. 3) and on the back panel (XLR connectors) (Fig. 6). The front panel insert jack deselects the back panel insert connector. In this way the user can permanently connect the most used outboard to the insert return connectors on the back and, when a new outboard is required, it can be connected by using the front panel connectors. Automatically the back connected outboard will be disconnected. In this way additional outboards can be easily connected without the access on the back panel.

IMPORTANT NOTE

The CL-123 can be used as a separate mic-line preamplifier and equalizer.

MIC-LINE PREAMP: The send out (after the mic-line stage) is used as the output of the mic-line preamplifier (electronically balanced, out level +4 dBu).

EQUALIZER: The return is used as the preamplifier line input (electronically balanced, out level +4 dBu).

OUTPUT XLR

The output signal is available on two XLRs: the first one on the front panel (Fig. 3), the second one on the back panel (Fig. 6). The two connectors can be used together without problems.

APPENDIX A: Connections

CL - 123 CONNESSIONI
WIRING CL - 123

INGRESSO LINEA LINE INPUT	Jack Mono 6,35 Mono Jack 1/4"	Può essere usato anche Jack stereo Stereo Jacks can be used
INGRESSO MICROFONO MICROPHONE INPUT	XLR XLR	Posteriore - duplicato sul pannello anteriore E' possibile usare uno solo dei 2 ingressi On the back - doubled on front panel It is possible to use one input only
	1 = Massa 2 = FASE + 3 = FASE -	1 = Ground 2 = PHASE + 3 = PHASE -
	Solo linea bilanciata - Non connettere linee sbilanciate Balanced line only - don't connect unbalanced cables	
USCITA INSERZIONE INSERT SEND	XLR Jack Stereo 6,35 XLR Stereo Jack 1/4"	Posteriore Sul pannello frontale On the back On the front panel
	1 = Massa 2 = FASE + 3 = FASE -	1 = Ground 2 = PHASE + 3 = PHASE -
	Linea bilanciata - Possibile connettere linee sbilanciate Balanced line - Unbalanced cables can be connected	
RITORNO INSERZIONE INSERT RETURN	XLR Jack Stereo 6,35 XLR Stereo Jack 1/4"	Posteriore Sul pannello frontale On the back On the front panel
	1 = Massa 2 = FASE + 3 = FASE -	1 = Ground 2 = PHASE + 3 = PHASE -
	Linea bilanciata - Possibile connettere linee sbilanciate Balanced line - Unbalanced cables can be connected	
USCITA MASTER MAIN OUTPUT	XLR XLR	Posteriore - duplicato sul pannello anteriore E' possibile usare contemporaneamente tutte e due le uscite On the back - doubled on front panel It is possible to use both output
	1 = Massa 2 = FASE + 3 = FASE -	1 = Ground 2 = PHASE + 3 = PHASE -
	Linea bilanciata - Possibile connettere linee sbilanciate Balanced line - Unbalanced cables can be connected	

FIG. 4 CL-123 Connections

APPENDIX B: Front Panel

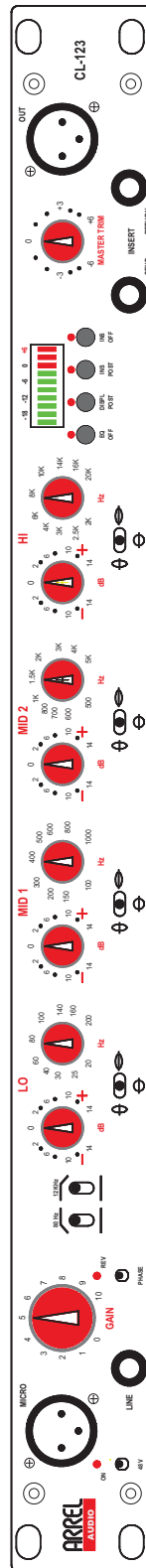


FIG. 5 CL-123 Front Panel

APPENDIX C: Back Panel

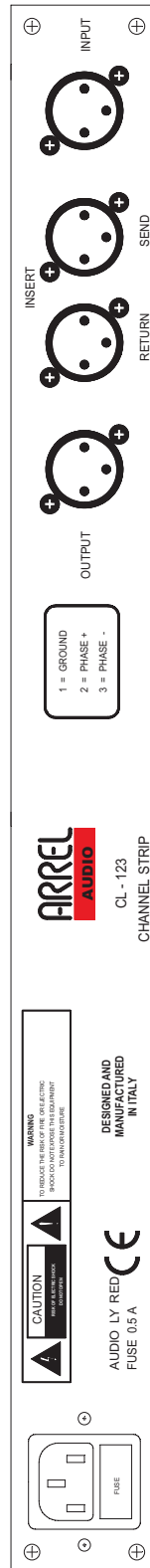


FIG. 6 CL-123 Back Panel

APPENDIX E: Measurements

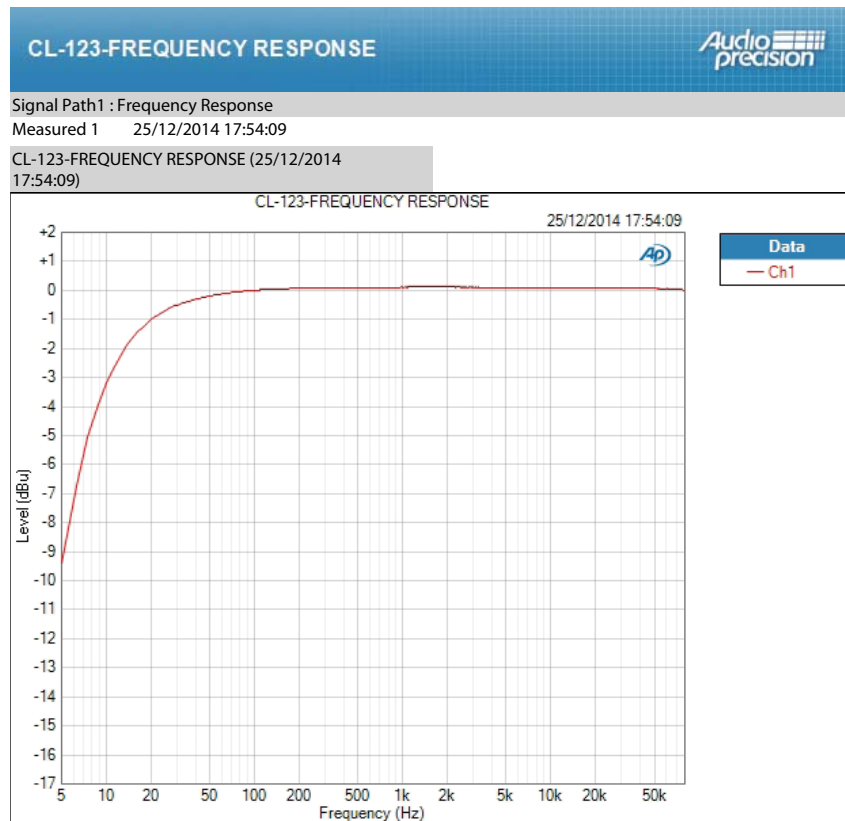


FIG. 8 Frequency Response

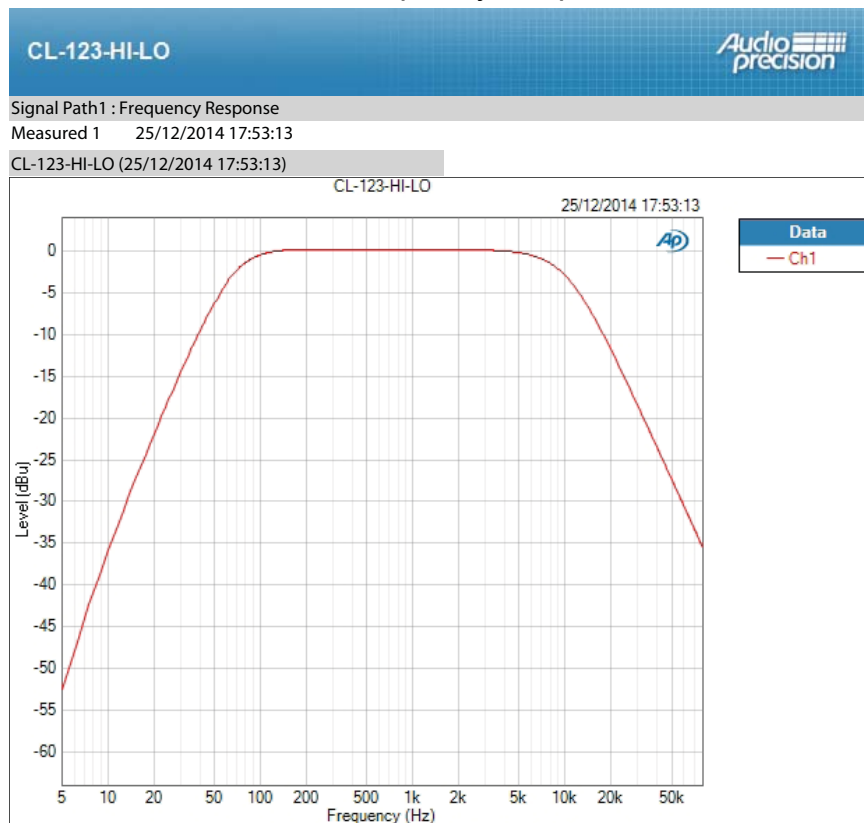


FIG. 8 Frequency Response LPF and HPF

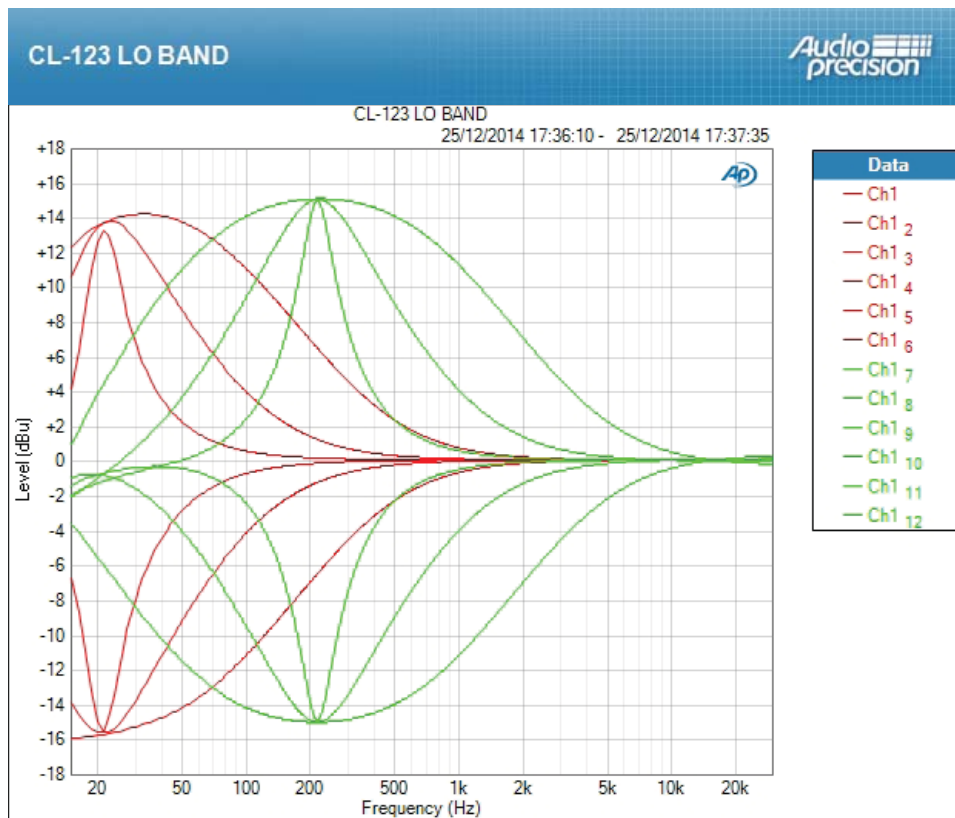


FIG. 8 Equalizer LO Band

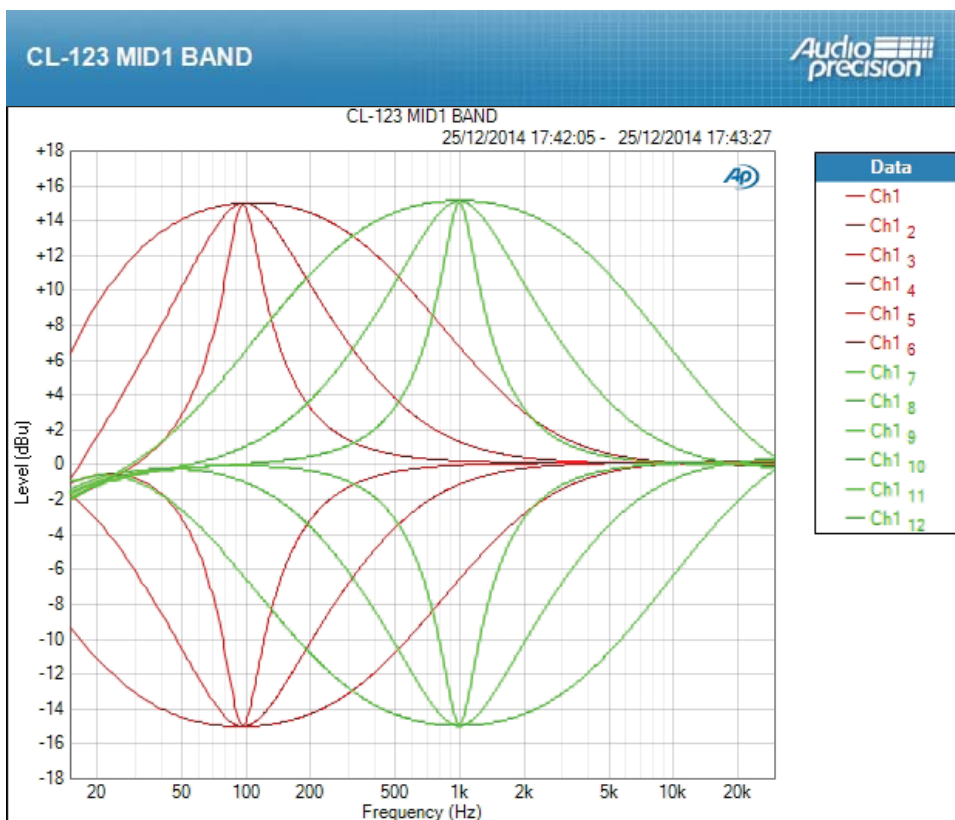


FIG. 8 Equalizer MID 1 Band

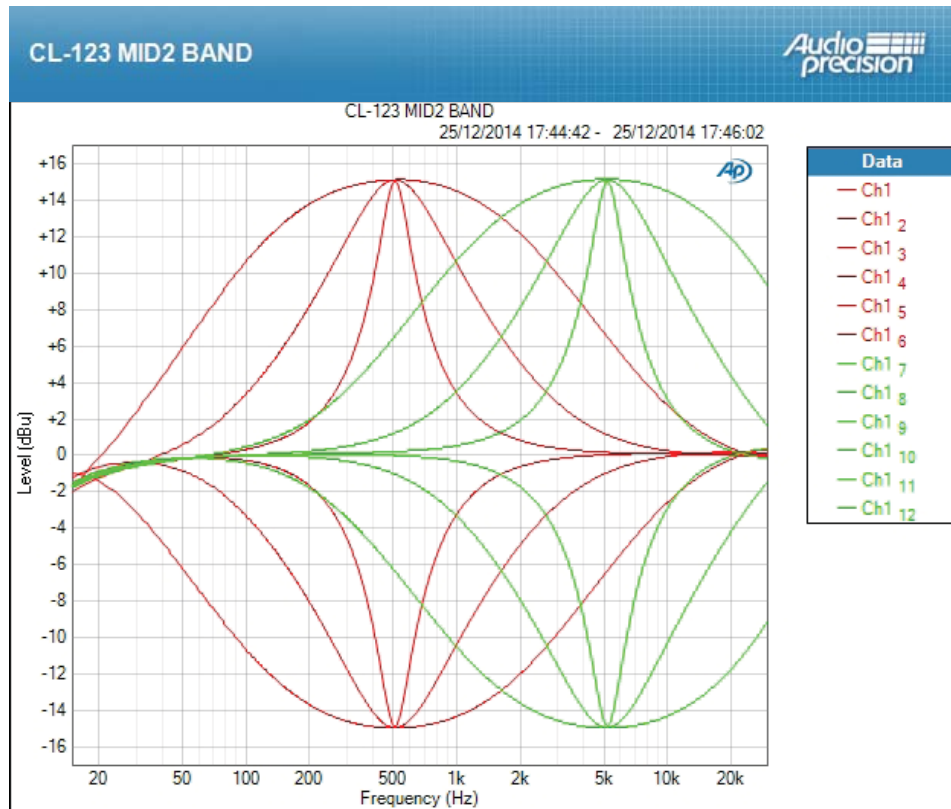


FIG. 8 Equalizer MID 2 Band

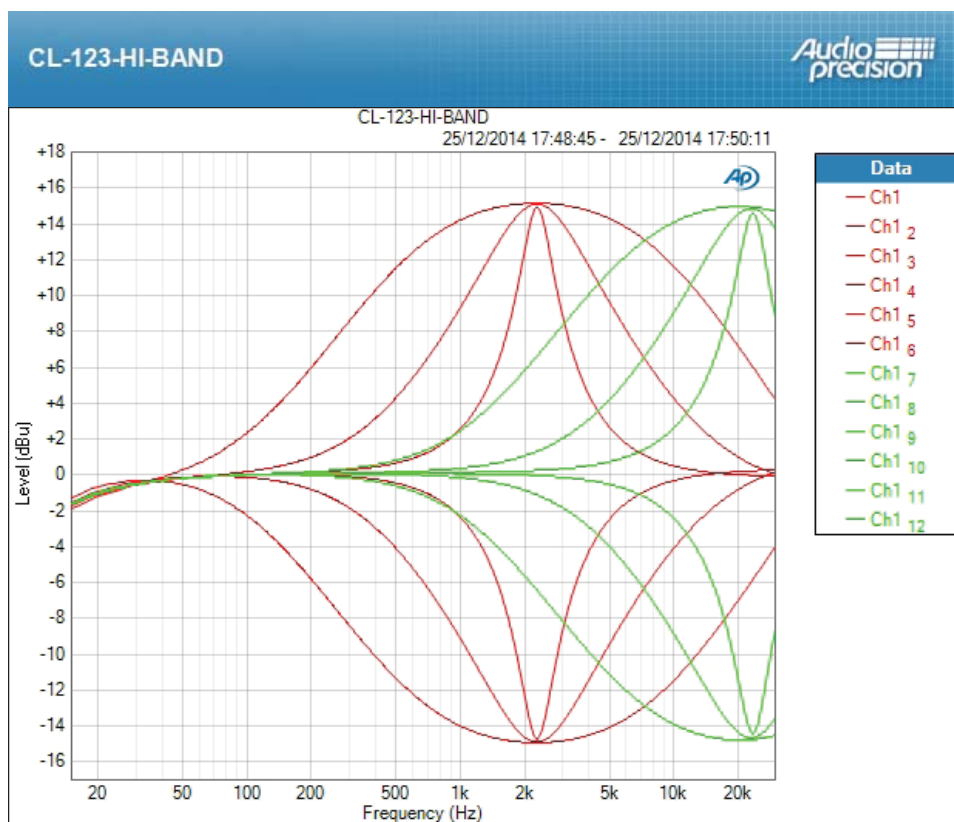


FIG. 8 Equalizer HI Band

TECHNICAL SPECIFICATIONS

Number of Channels:	1
Power Supply	Linear Regulator $\pm$ 18 VDC (Balanced C-Core Transformer)
Operating Voltage	220V 50 Hz, (110V 60 Hz version available)
Power Consumption	20 W
Microphone Input	Electronically balanced
Microphone Gain	66 dB range with rotary knob control Theoretical max input level +24 dBu (internally limited to +20 dBu)
Line Input	Unbalanced, Impedance 22 K Ω , (this input can be also used as EQ input)
Line Gain	30 dB range with rotary knob control Level 0/-30 dBu. Max +23 dBu
Bandwidth	5 - 200.000 Hz -1dB, perfect square wave up to 20 KHz
Distortion + Noise	<0.003% (typical 0.001%)
Low Cut Filter	80 Hz, 12 dB / Oct
High Cut Filter	8 KHz, 12 dB / Oct
Parametric EQ	4 band with overlapping frequencies: 20 - 200 Hz, 100 - 1.0 Hz, 500 - 5.0 Hz, 2.0 - 20.000 Hz Three Q settings – narrow, normal, wide $\pm$ 14 dB gain range for emphasis/de-emphasis
Output	Electronically Balanced Level +4 dBu. Max +28 dBu, external load > 600 Ω
Insert send	Electronically Balanced, lev +4 dBu, max. +28 dBu, external load > 600 Ω
Insert return	Electronically Balanced, lev +4 dBu, max. +23 dBu, Input impedance > 10 K Ω
Front Panel Controls	Gain rotary knobs (min gain and level gain), 48V Phantom Power switch Lo-Cut and Hi-Cut switches, Phase Reverse switch “3-way Q settings” toggle switch (each band), $\pm$ 14 dB range for boost/cut Central Frequency rotary knob, 4x push-button for EQ off Pre/Post EQ, Display mode: Pre/Post Insert, Insert off Output level rotary knob
Front Panel Connectors	1/4" TRS jack for line input Balanced XLR female for microphone input 2x 1/4" TRS jacks for insert connections (Send/Return) Balanced XLR male output
Front Panel Indicators	Level Indicator 10-LED Bargraph (7x green, 3x red). 1.5 dB step, 4x red LEDs (48V Phantom Power, Hi-Cut, Lo-Cut, Phase).
Rear Panel Input Connectors	Balanced XLR female input Balanced XLR male output Balanced XLR female/male for Insert (Send/Return)
AC mains	IEC C13 16 A connector, AC mains cord with IEC Schuko 16A
Construction	19" 1U rack mount metal box
Dimensions	W 483 mm / 19", H 44.45 mm/1.75" (1 U), D 225 mm / 8.86"
Weight	2.5 kg